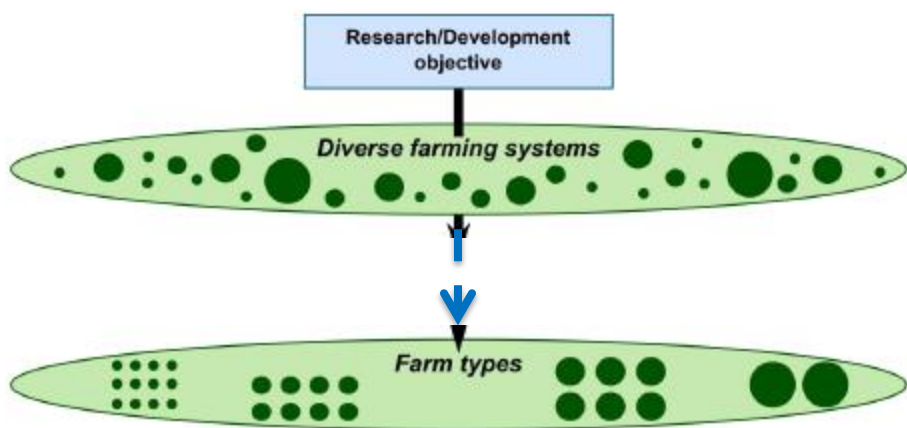


Humidtropics

Hypothesis based typologies for capturing diversity

Stephanie Alvarez, Wim Paas, Katrien Descheemaeker, Jeroen Groot

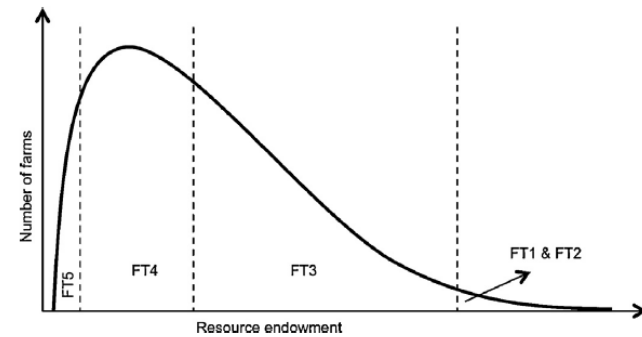
Wageningen University, Farming Systems Ecology & Plant Production Systems groups



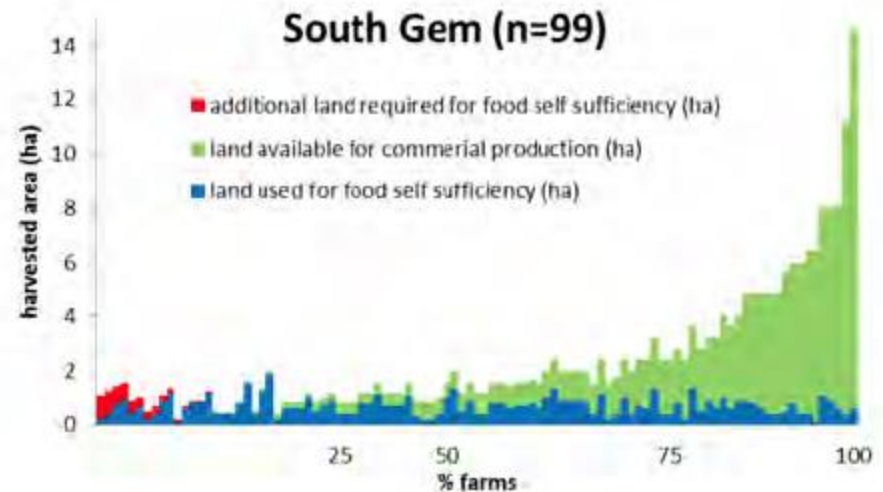
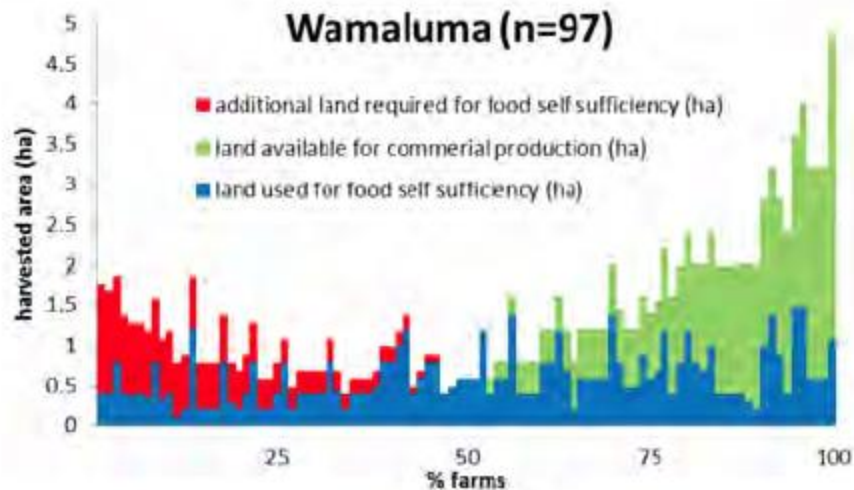
Introduction

Aim of typologies:

- Capture variability of farming systems
- Understand heterogeneity in regions



Franke et al., 2014



Hengsdijk et al., 2014; N2Africa report – 2 action sites in Kenya

Introduction

Aim of typologies:

- Capture variability of farming systems
- Understand heterogeneity in regions

For

1. Targeting and tailoring
2. Scaling out; dissemination
3. Selection of representative farms
4. Scaling up; extrapolate to larger scale

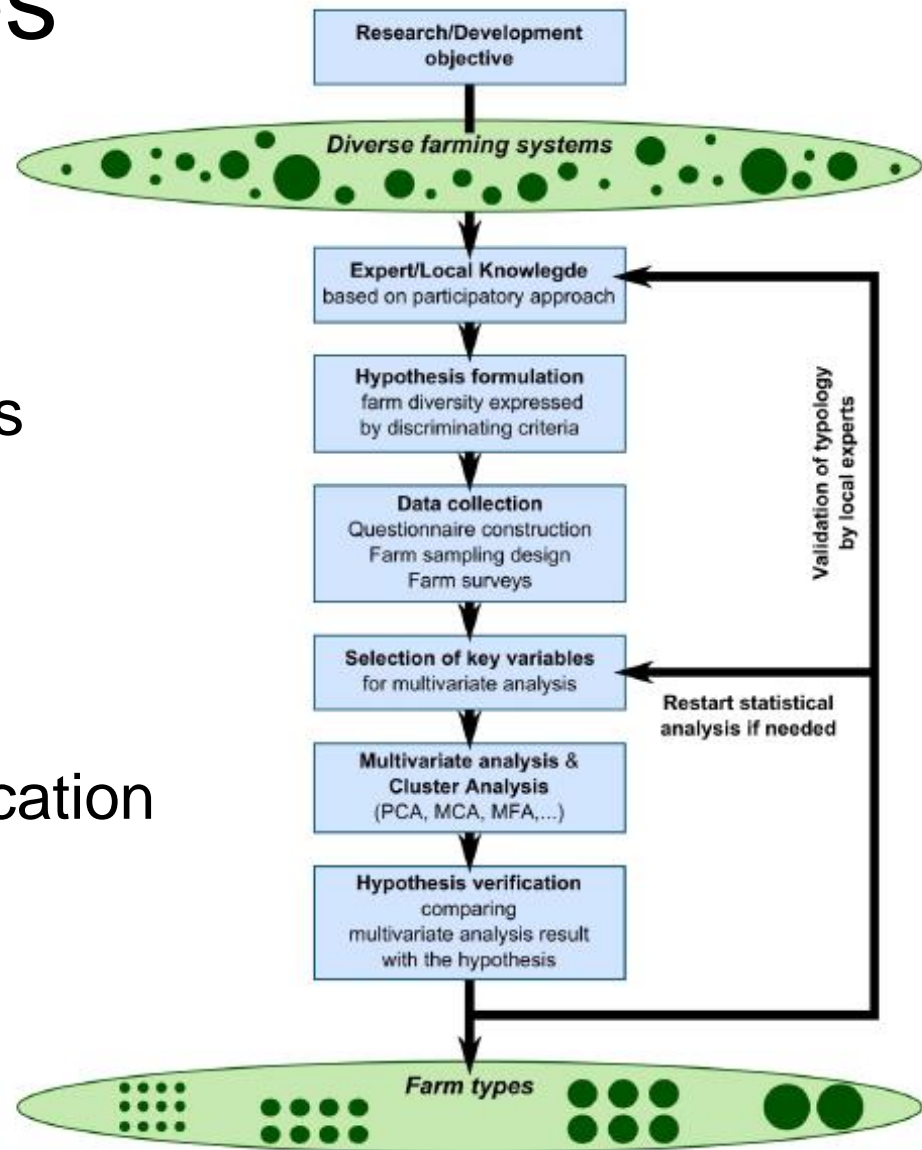
Guidelines

Major steps:

1. What is the objective?
2. Hypothesis on farming systems diversity
3. Data collection
4. Selection of key variables
5. Clustering the farms
6. Hypothesis and typology verification

Overall:

Combine expert knowledge from participatory work with statistical analysis



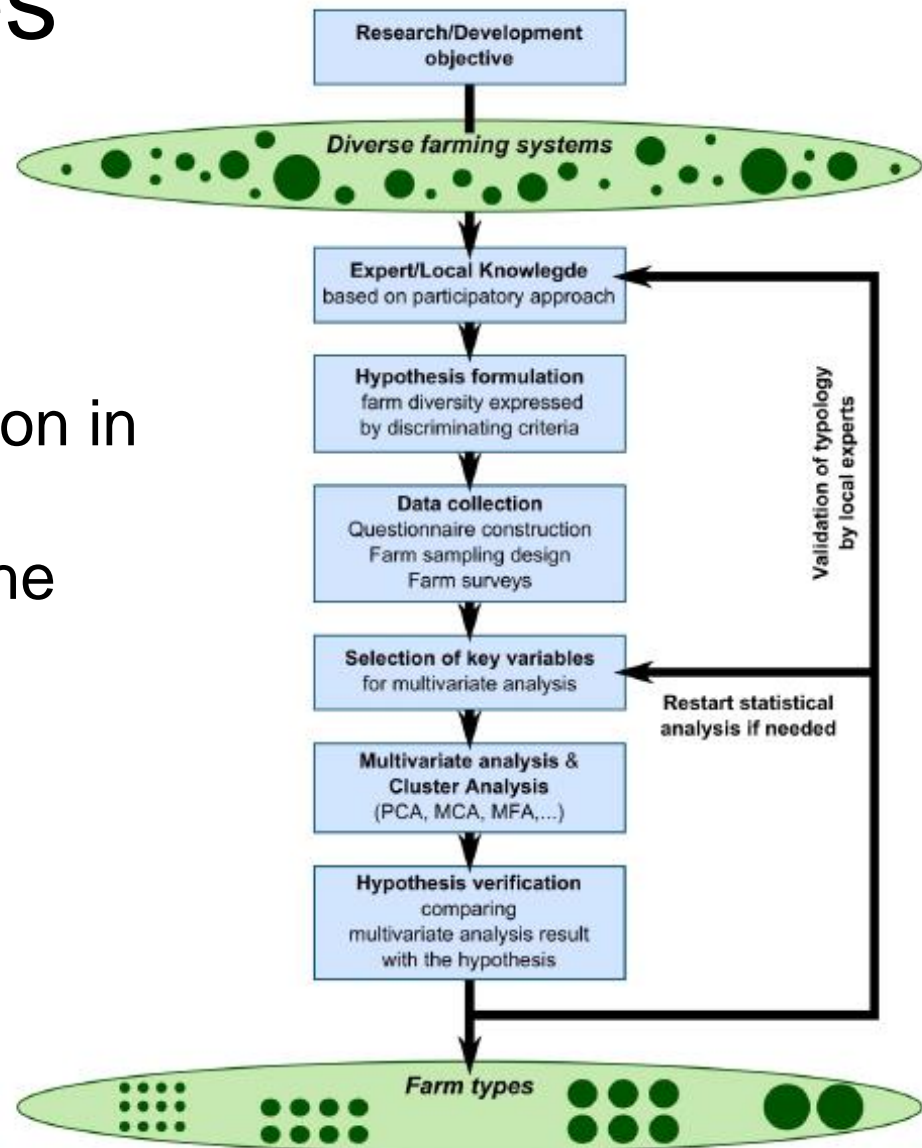
Guidelines

Major steps:

1. What is the objective?

Specific: Improve forage production in mixed systems of Rwanda

Broad: Improve food security in the humid tropics

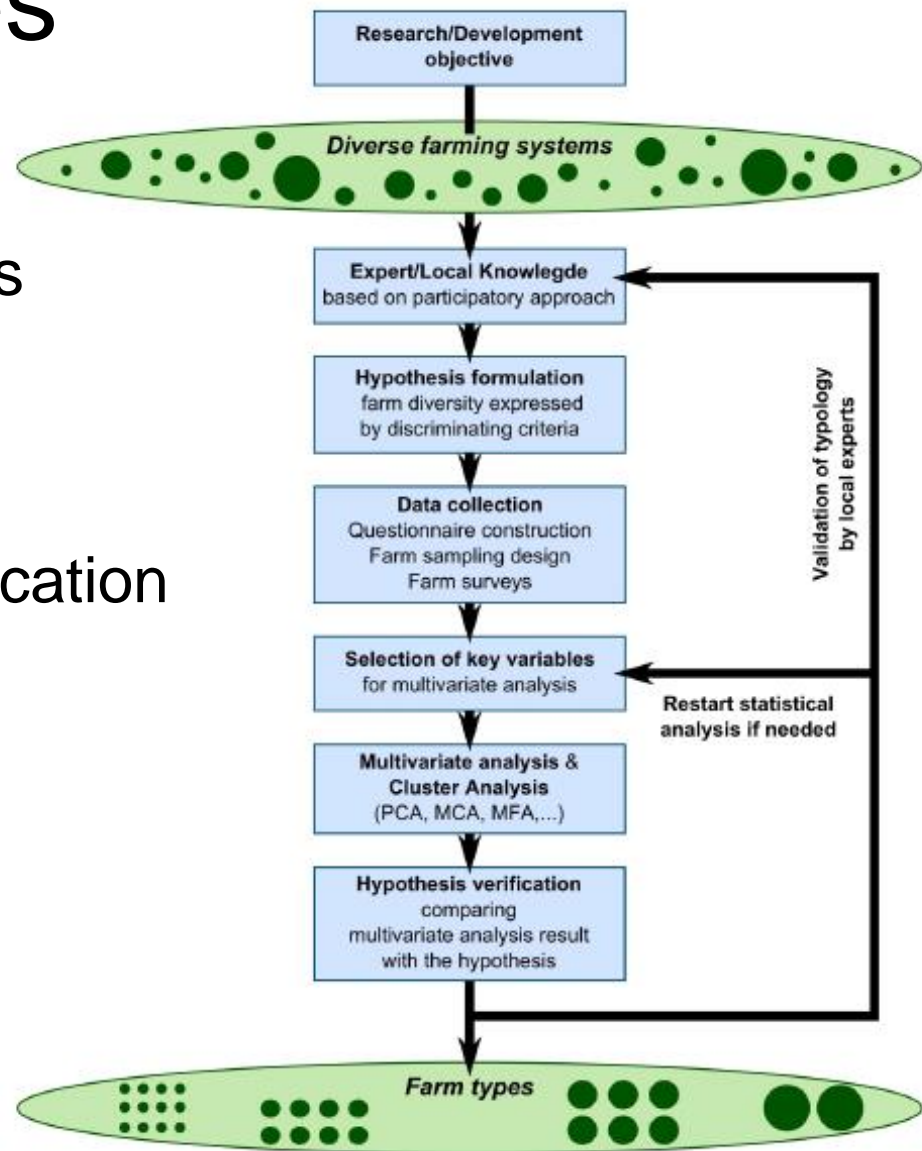


Guidelines

Major steps:

2. Hypothesis on farming systems diversity

Participatory process for ex-ante description of farm types ; identification of discriminating criteria



Guidelines

Major steps:

3. Data collection
4. Selection of key variables

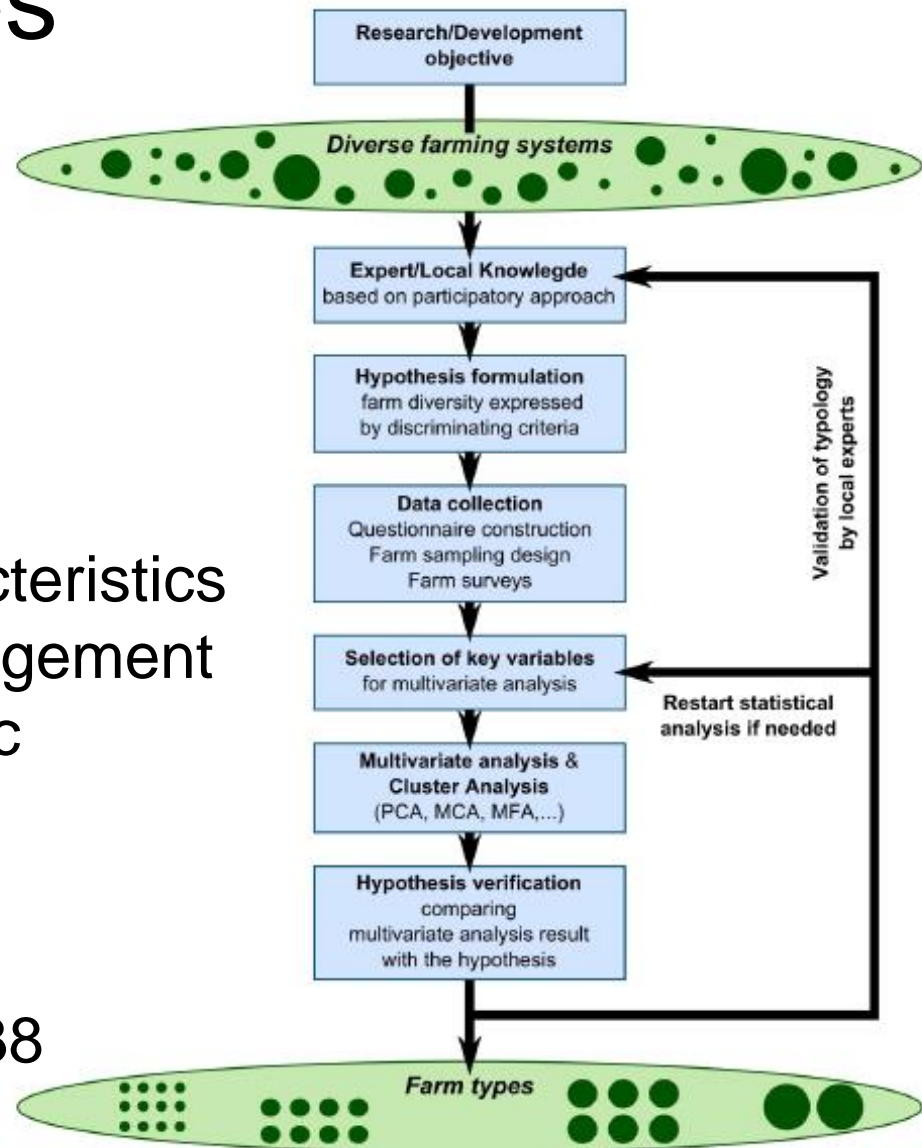
Variable categories:

- Structural vs. functional characteristics
- Resource availability vs. management
- Biophysical vs. socio-economic
- Farm vs. external

key variables: 5 - 46, av. 15

sampled farms: 18 – 2746, av. 138

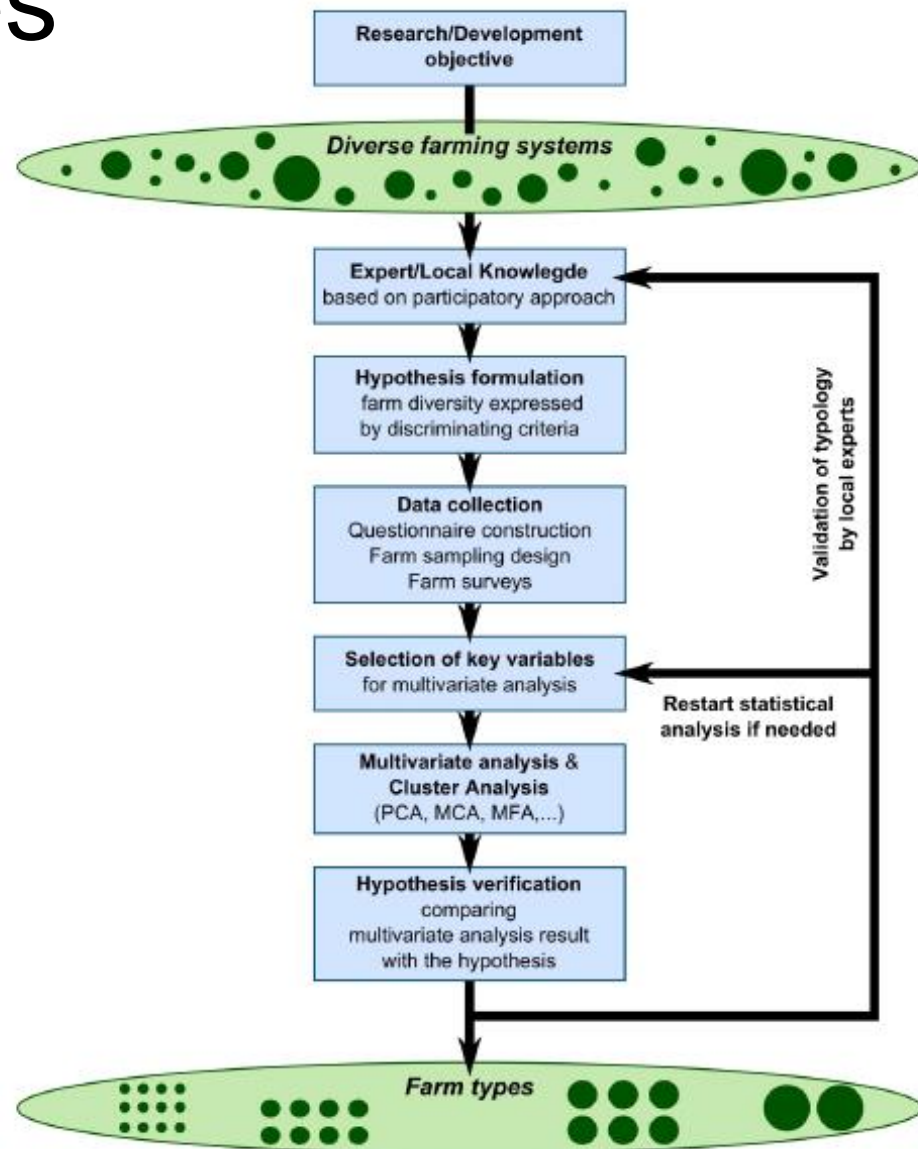
#farms > 5 * #variables



Guidelines

Major steps:

5. Clustering the farms



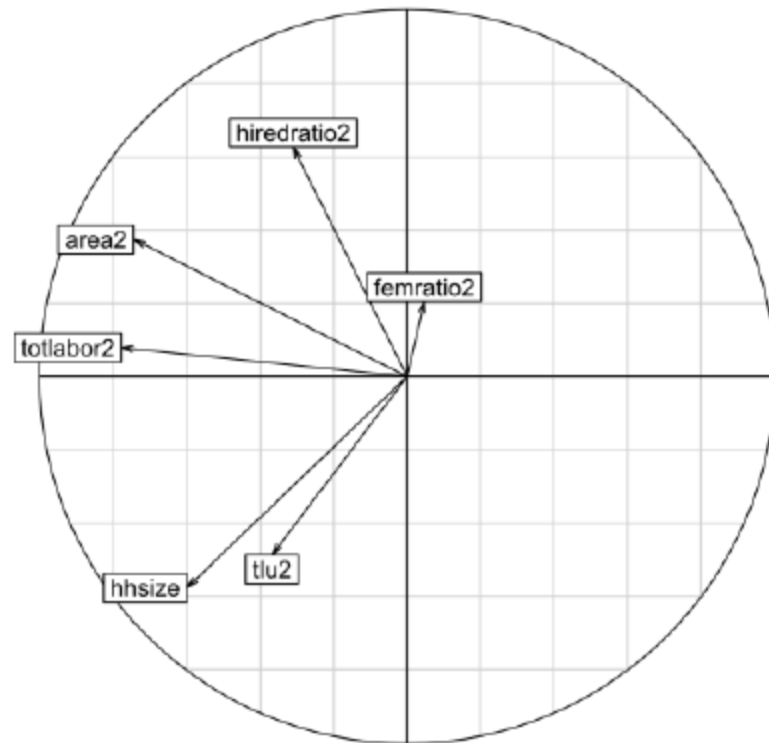
Guidelines

Major steps:

5. Clustering the farming systems

a. Multivariate statistics (PCA, MCA, MFA)

→ Discriminating variables



Guidelines

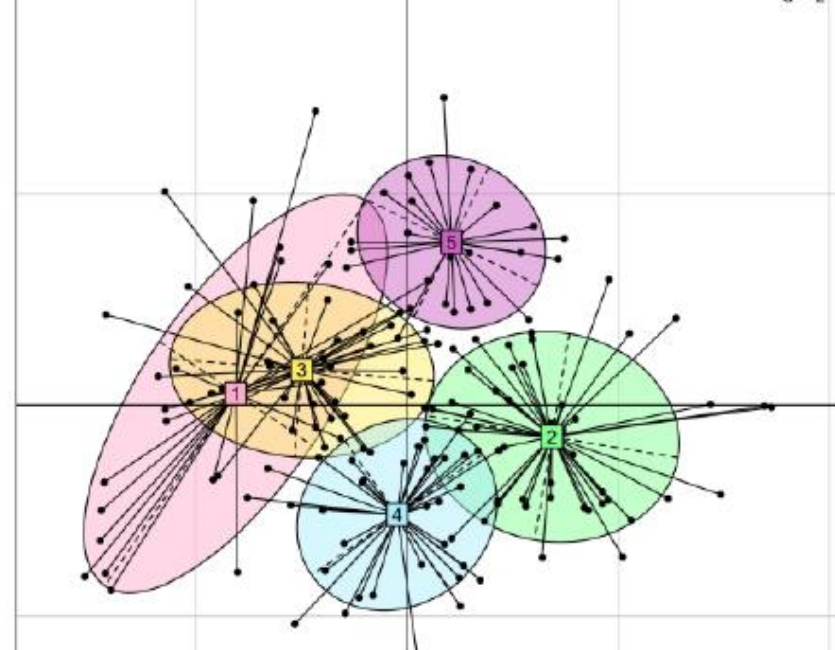
Major steps:

5. Clustering the farming systems

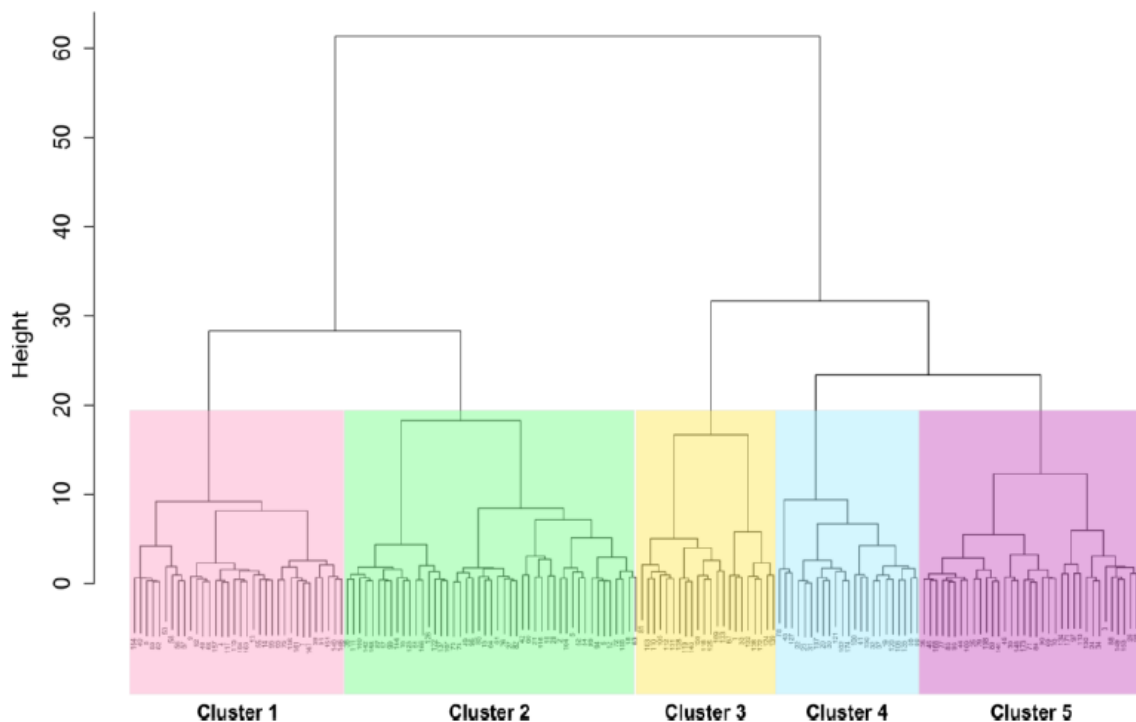
a. Multivariate statistics
(PCA, MCA, MFA)

→ Discriminating variables

b. Cluster analysis



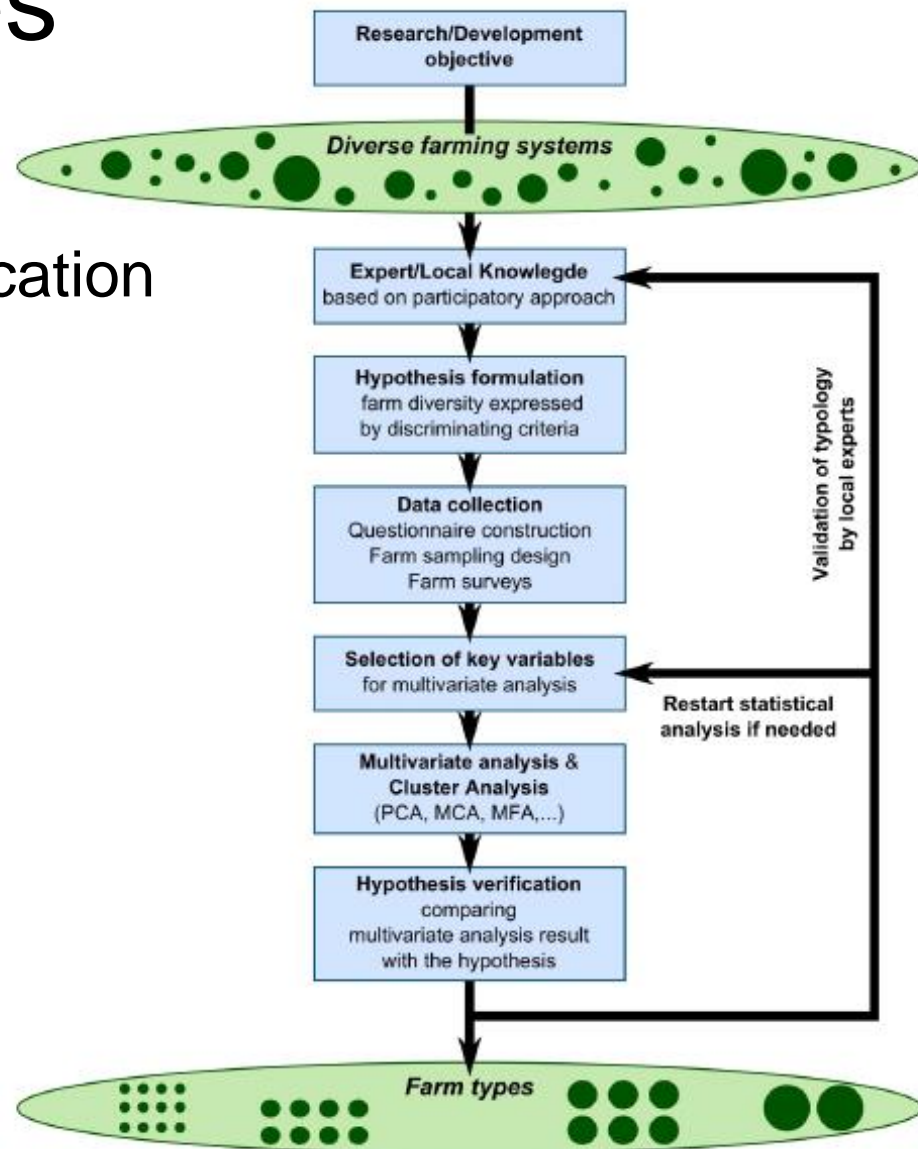
Cluster Dendrogram



Guidelines

Major steps:

6. Hypothesis and typology verification

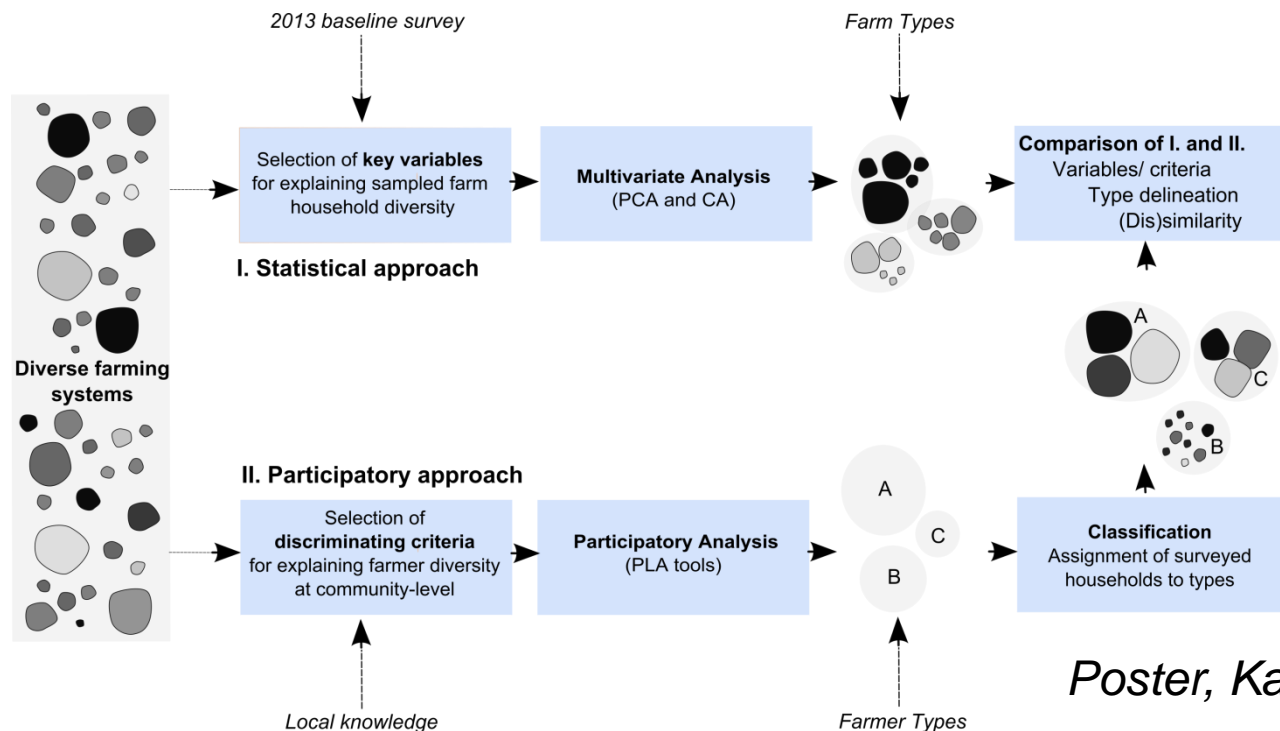


Guidelines

Major steps:

6. Hypothesis and typology verification

Example from Ghana – participatory and statistical approach

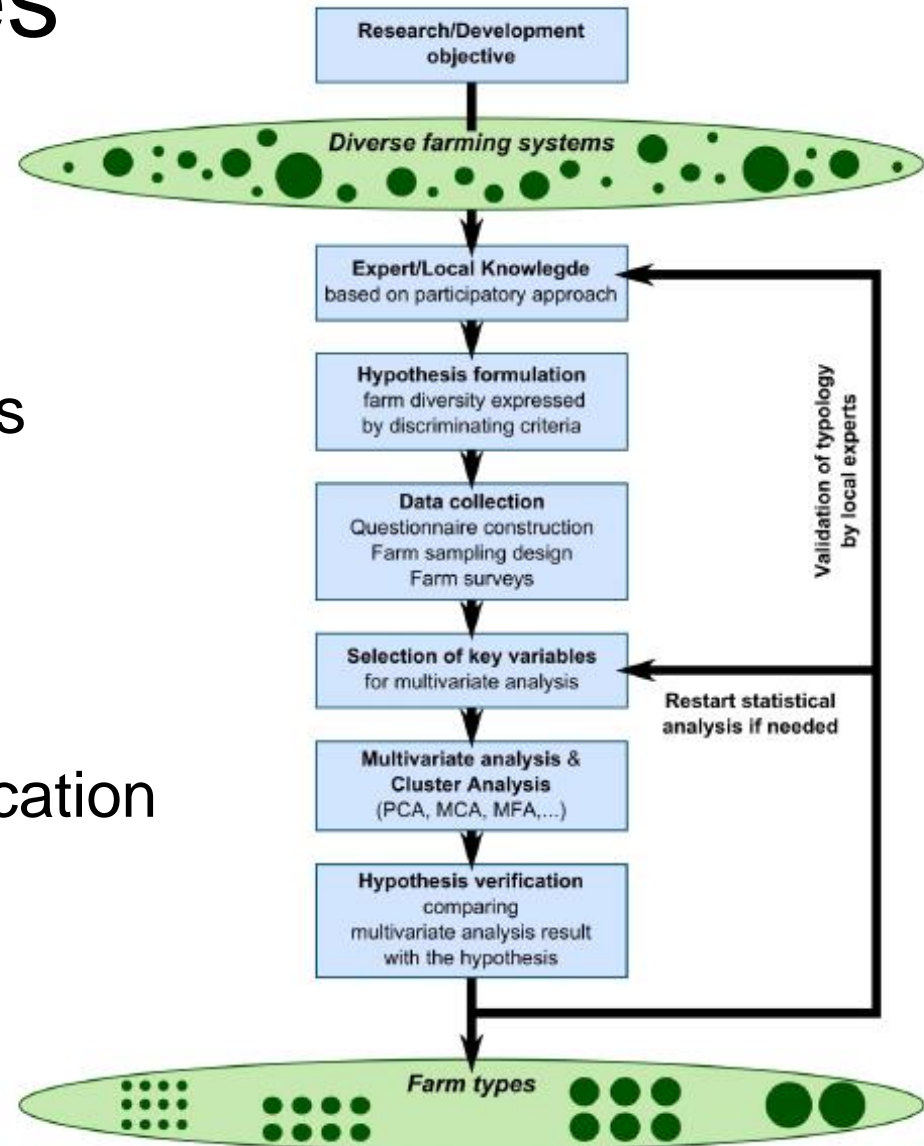


Poster, Katja Kuivanen et al.

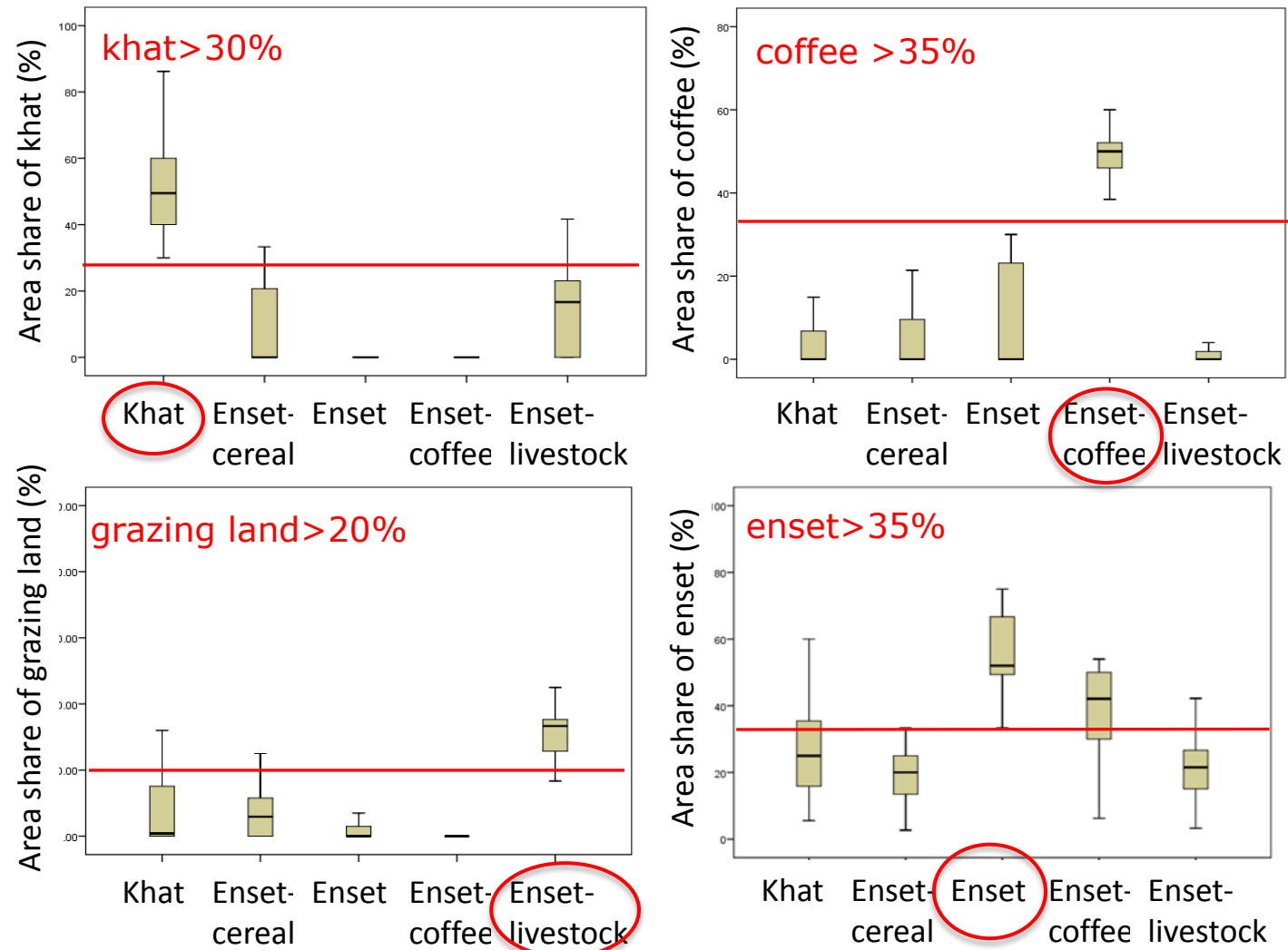
Guidelines

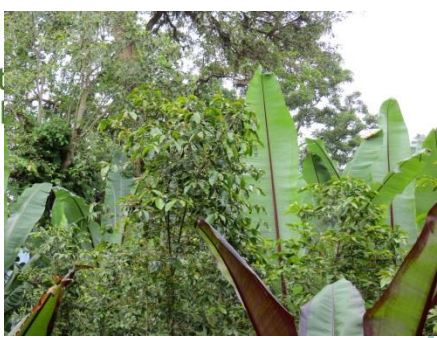
Major steps:

1. What is the objective?
2. Hypothesis on farming systems diversity
3. Data collection
4. Selection of key variables
5. Clustering the farms
6. Hypothesis and typology verification



Homegarden types in Ethiopia





Enset-coffee



Enset-livestock



Enset-cereal-vegetable

Enset



4 types

3 types

2 types

Farms

coffee
>35%

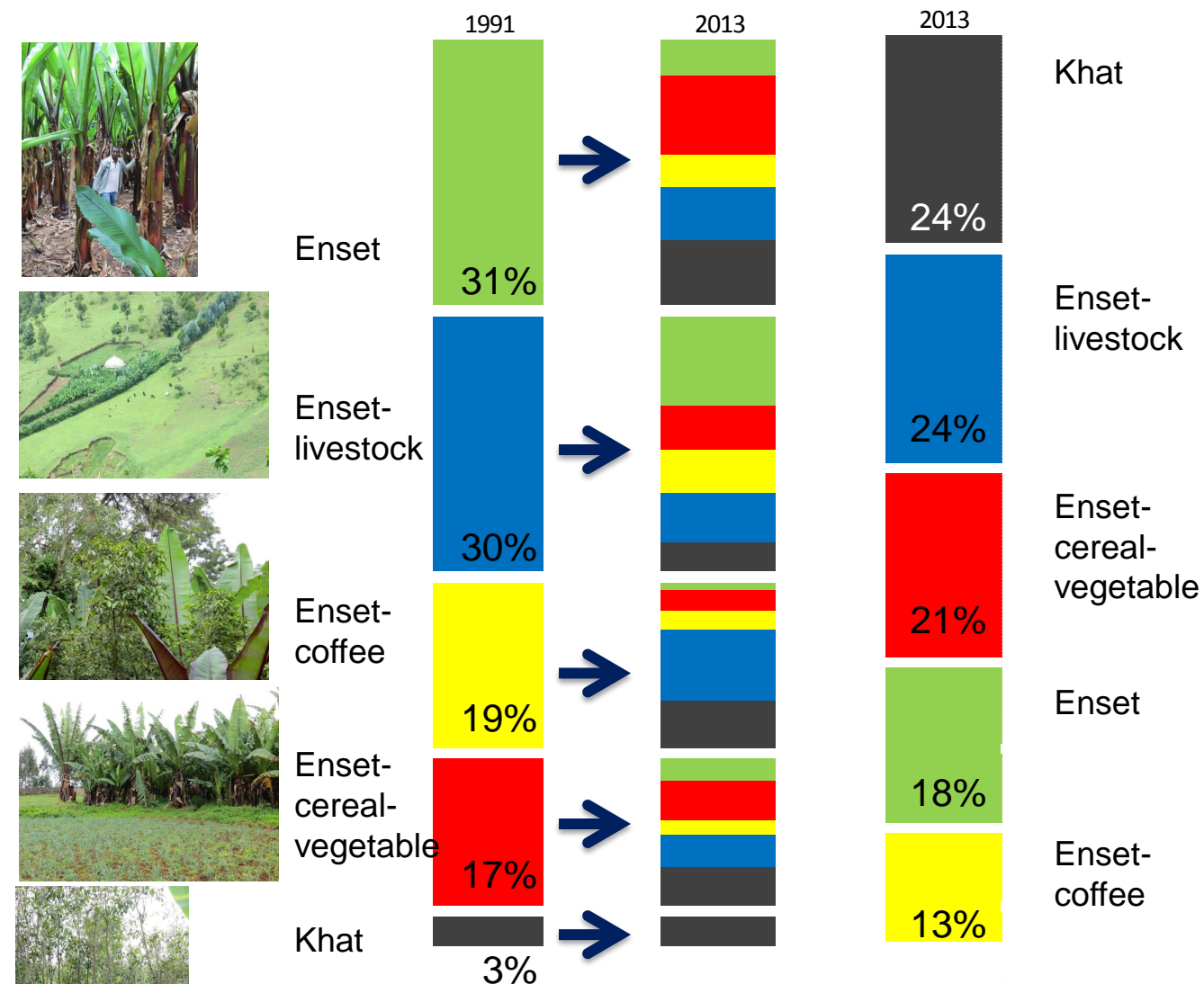
Grazing
land>20%

khat
>30%

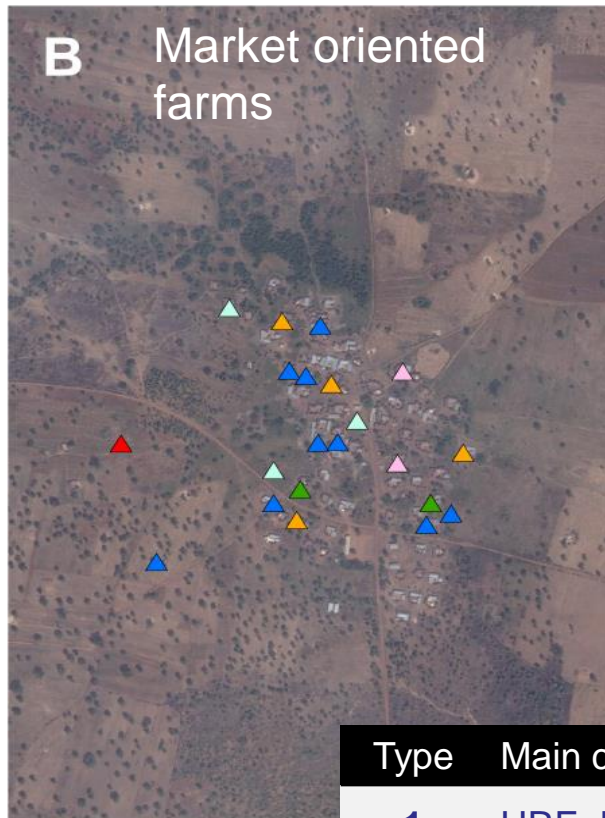
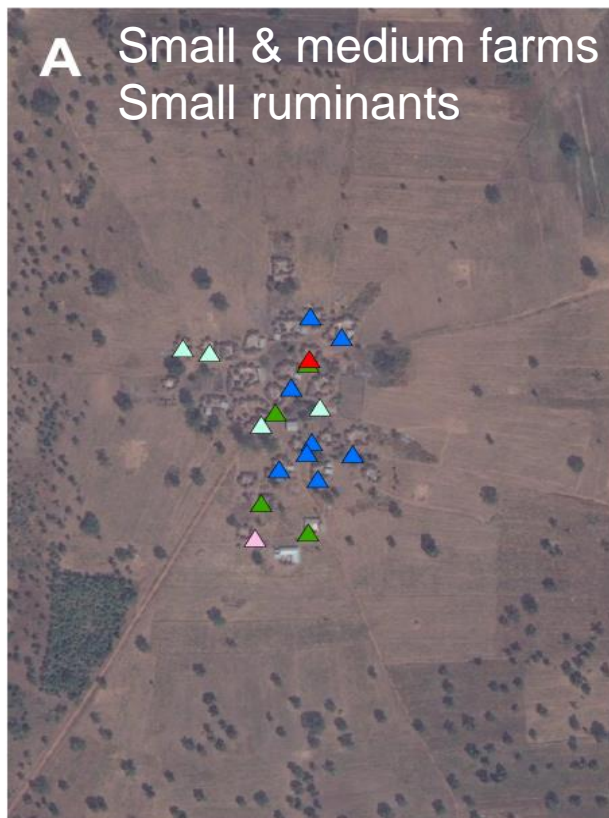
Khat



Classification trees and trends



Spatial organization of farm types



Type 1 (Red triangle) Type 2 (Orange triangle) Type 3 (Green triangle)
 Type 4 (Blue triangle) Type 5 (Light green triangle) Type 6 (Pink triangle)

Type	Main characteristics
1	HRE, large cattle herd, ample off-farm activities
2	MRE, large farms, market orientation
3	MRE, small ruminants, on-farm labour intensive
4	MRE, small ruminants, ample hired labour
5	LRE, maize dominated, few off-farm activities
6	SRC, livestock sales, ample off-farm activities

Katja Kuivanen

Statistical background and examples

Appendix C of the report

R code to explore the data and run the analysis

Tips for interpretation of statistical results

```

tanzaT <- tanza[,match(c("hhszize", "area2", "totlabor2", "femratio2",
"hiredratio2", "tlu2", "ncrop2" ), dimnames(tanza)[[2]])]

tanza.pca <- dudi.pca(tanzaT, center=T, scale=T, scannf=T, nf=5)
> Select the number of axes: 3
  
```

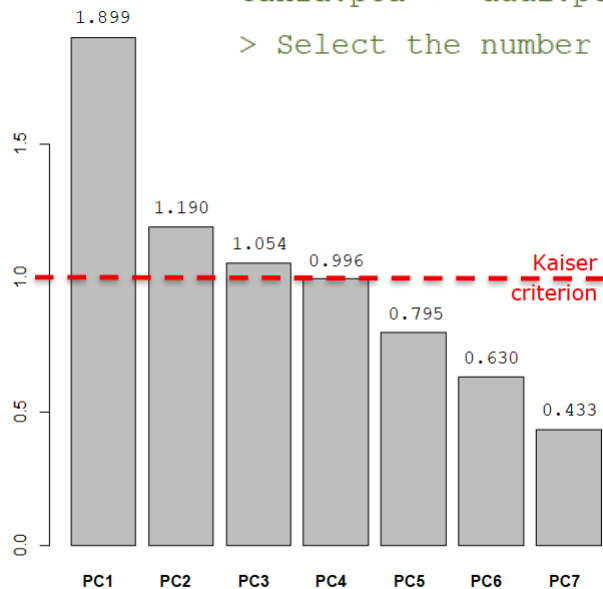
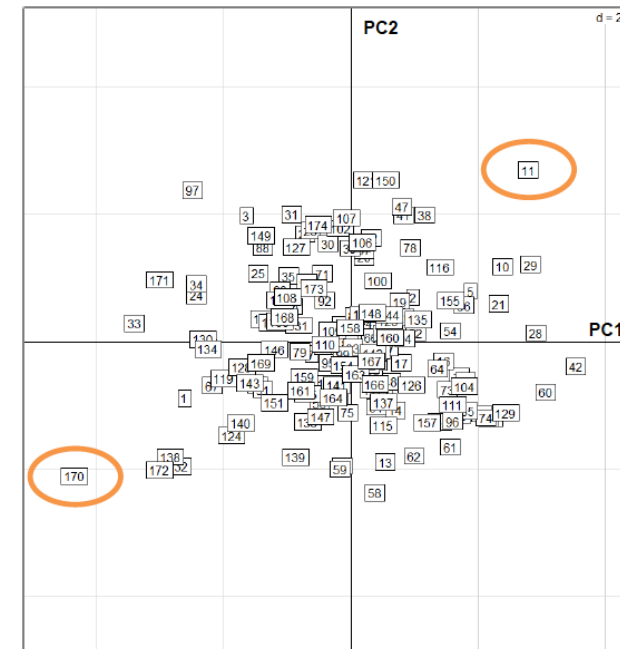


Figure A5: Barplot of the eigenvalues per principal component (PC)

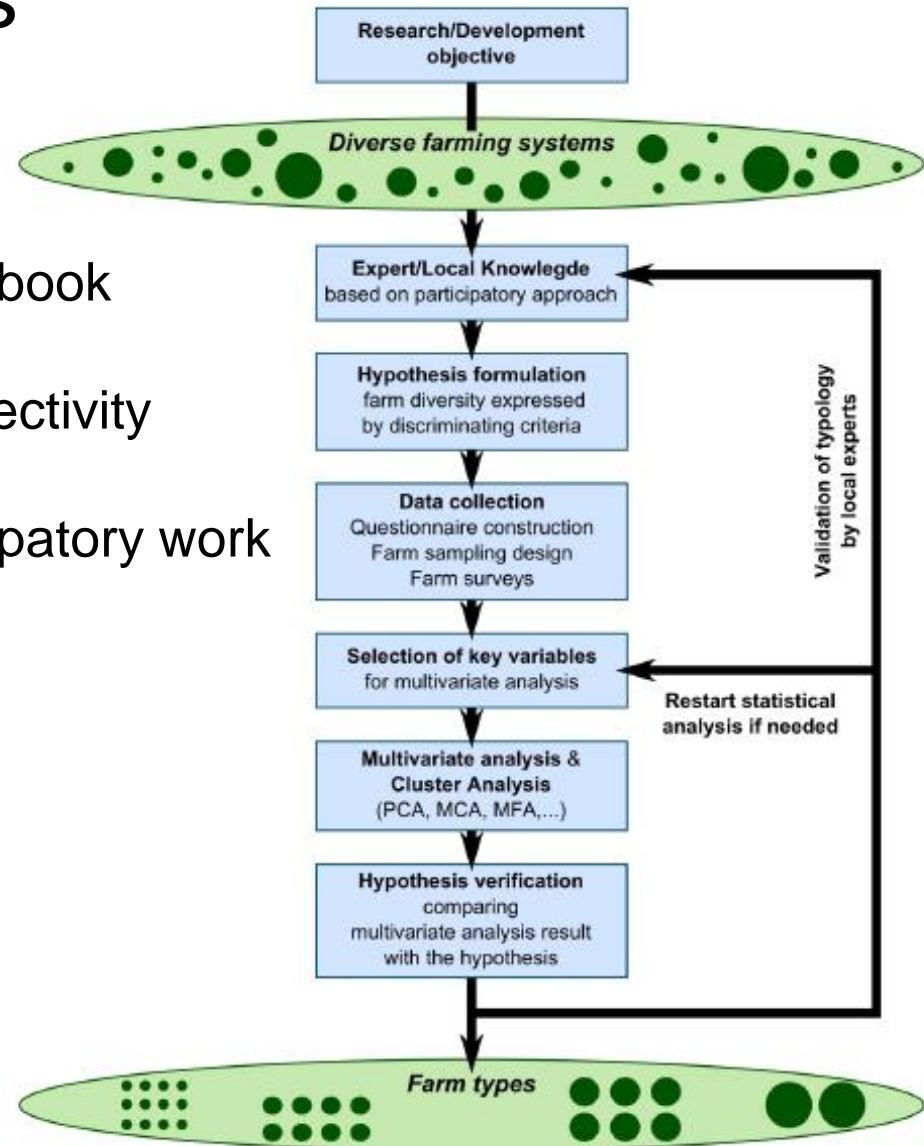


Conclusions

Typology guidelines: 6 steps, no recipe book

Interpretation of results ; degree of subjectivity

Combine statistical methods with participatory work



Thank you



<https://humidtropics.cgiar.org/constructing-typologies-to-capture-farming-systems-diversity>
<http://humidtropics.cgiar.org/openaccess/?did=231>